PART I

Unit 1: Introduction to DevOps

a. DevOps Overview
b. The relationship between Agile and DevOps
c. DevOps Toolchain
d. Challenges with the Traditional Approach
e. Addressing Challenges through DevOps
f. Categories of DevOps Tools
g. Linux and Shell Scripting Basics
h. Knowledge Check

Unit-2: Version Control Systems

a. Overview of Version Control Systems
b. Benefits of version control systems
c. Role of Version Control Systems
d. Types of Version Control Systems
e. Overview of Git
f. Advantages of Git: Performance, Security, Flexibility
g. File Status Lifecycle in Git
h. Creating a GitHub Account
i. Install Git on Windows
j. Configuring Git and Verifying
k. Starting a New Local Repository with Git
l. Git Commits
m. Tracking Files with Git
n. Staging Files with Git
o. Removing files from the staging area
p. Committing Changes to Git
q. Push Pull to and From a Remote Repository

r. Working with Branches

Unit 3: Continuous Integration, Continuous Deployment, and Build Tools

a. Overview and Importance of Continuous Integration and Continuous Deployment
b. Overview and Features of Jenkins
c. Set up Jenkins
d. Configure Jenkins
e. Configure Plugins
f. Creating Users and Secure Access
g. Configure a job
h. Creating and Configuring Node
i. Running build on Node
j. Overview of Maven
k. Installing Maven
l. Maven Goals and Phases
m. Build a web app using Maven
n. Deploy the build with Jenkins
o. Creating a downstream job
p. Trigger the downstream job
q. Jenkins file
r. Create a pipeline using a Jenkins file

Unit 4: Configuration Management Tools

a. Overview of Configuration Management Tools
b. Managing Infrastructure
c. Types of Configuration Management Tools
d. **Overview of Puppet**
    i. Features of the Puppet System

ii. Puppet − Workflow
iii. Puppet − Key Components
iv. Puppet architecture
v. Puppet Master Config File
vi. Resource Type
vii. Installing and configuring Puppet Master
viii. Installing and configuring Puppet Agent
ix. Run a Manifest and check facts on the Agent

e. **Overview of Chef**

i. Chef – Workflow
ii. Chef – Key Components
iii. Workstation Setup
iv. Server Setup
v. Node Setup
vi. Hosted Chef – Creating an account
vii. Configure Hosted Chef
viii. Chef Development Kit
ix. Chef Starter Kit
x. Install and Configure Development Kit
xi. Knife Setup
xii. Chef CookBooks
xiii. Chef – Testing Cookbook on Node

f. **Overview of Ansible**

i. Ansible Workflow
ii. Installation Process
iii. Ansible inventory files
iv. Ansible modules
v. Parallelism and Shell Commands
vi. Facts

vii. Playbooks

viii. Create a Playbook

Unit 5: Terraform

a. Terraform Introduction

b. Install and Configure Terraform

c. Ansible V/S Terraform

d. Configure AWS EC2 instances using Terraform

e. HCL Terraform language

Unit 6: Containerization with Docker and Kubernetes

a. Docker – Overview

b. Components of Docker

c. Docker Engine

d. Docker Hub

e. Docker Compose

f. Installing Docker on Linux

g. Docker – Images

h. Docker – Containers

i. Working with Containers

j. Docker – File

k. Building Files

l. Building a Web Server Docker File

m. Docker – Swarm

n. Kubernetes Architecture

o. Main Components of Kubernetes

p. Install Kubernetes and Cluster Initialization

q. Autoscaling in Kubernetes

r. Test Cluster by deploying Nginx

Unit 7: Jfrog Artifactory

a. Introduction to Artifactory
b. Difference between Code repo and Artifactory
c. Install and Configure Artifactory
d. Integrate Artifactory with Jenkins
e. Directory types

Unit 8: Continuous Monitoring

a. Continuous Monitoring
b. What is Nagios
c. Nagios – Products
d. Nagios – Installation
e. Nagios – Configuration
f. Nagios – Features
g. Hosts and Services
h. Commands
i. Active and Passive Checks
j. Nagios – NRPE

Unit 9: Log Management with ELK

a. ELK Stack
b. What is Elasticsearch?
c. What is Logstash?
d. What is Kibana?
e. What are Beats?
f. Why Log Analysis?
g. ELK vs. Splunk
h. Install and configure ELK
i. Install and configure Filebeat

Unit 10: Need for Cloud in DevOps

a. Infrastructure as a service (IaaS)

b. Platform as a service (PaaS)
c. Software as a service (SaaS)
d. Types of Cloud Computing
e. Private, Public, and Hybrid Cloud
f. Introduction to AWS
g. Simple monthly calculator
h. EC2 instances
i. S3 storage
j. AWS AMI
k. Identity and Access Cloud Management (IAM)
l. Virtual private (VPC)

PART II

Unit-1: Advanced Concepts & Real-Time Scenarios

Create an AWS VPC with private and public subnets using Terraform.

End-to-end automated build and release with Git, Jenkins, Maven, Ansible, and AWS EC2.